The Chandra X-Ray Observatory Flight Readiness Review Collection, 1993-1999
0.9 cubic feet
JPL 166

History

The Chandra X-ray Observatory, originally named the Advanced X-ray Astrophysics Facility (AXAF), was deployed from the Space Shuttle Columbia aboard the STS-93 mission in July 1999. Chandra is the most sophisticated X-ray observatory so far built. It is designed to observe X-rays from high-energy regions of the universe, such as hot gas in the remnants of exploded stars. The STS-93 mission was also notable for having the first female commander on any space mission, Eileen Collins.

There was an intense period of review activity in the preflight stages of AXAF. One cause for the reviews was the loss of the Mars Observer in August 1993. A failure review board concluded that the technical oversight process for the Mars Observer was flawed. The initial problems with the Hubble Space Telescope were also a point of trouble and a public relations nightmare for NASA, who wanted to avoid a similar situation with AXAF.

The AXAF Deployment and Pre-Ship Review focused on ensuring that no Space Shuttle safety issues existed and that the mission performance of the Observatory would be world class. The Deployment Review Team consisted of thirteen people, all with experience spanning manned and robotic space missions but none who were working in the AXAF Program. The Chair was Paul Hill, Shuttle Flight Director at Johnson Space Center. Vice Chair was John R. Casani, JPL Chief Engineer. The goal of the group was to provide assessment of the AXAF Program elements, including the ability of the AXAF to meet the Space Shuttle safety requirements, the expected performance of the Inertial Upper Stage (IUS) to which the observatory was connected, and the operational command and control of the spacecraft from launch throughout normal operations. Unlike the Hubble Space Telescope, the AXAF would be boosted into a higher orbit with an Inertial Upper Stage (IUS), and could not be serviced or repaired by future Shuttle missions. The AXAF Pre-Ship Review was conducted at TRW on August 4-6, 1998. The final report of the NASA Deployment Review Team was dated September 1, 1998.

In October 1998, NASA Administrator Dan Goldin recommended to NASA Chief Engineer Dan Mulville that JPL's John Casani serve as Chair of a Flight Readiness Independent Assessment of AXAF to be completed that December. The independent assessment was called due to the many schedule delays that resulted in a new Integration and Test plan, and the importance of the mission scientifically.

The Flight Readiness Independent Assessment Review Board was made up of independent experts who were to assess the AXAF program's readiness for launch. The assessment focused on assuring that the Observatory would perform to specification and that no safety issues existed.

In December 1998, AXAF was renamed the Chandra X-ray Observatory (CXO) in honor of the Indian-American Nobel Laureate physicist Subrahmanyan Chandrasekhar (1910-1995). "Chandra" also means "Moon" or "luminous" in Sanskrit.

The successfully deployed Chandra X-ray Telescope is operated by the Marshall Space Flight Center and the NASA Office of Space Science. TRW was the prime contractor for spacecraft integration and testing, with Boeing being the prime contractor for the IUS. Fred J. Wojtalik was the Chandra Program Manager, and Martin Weisskopf the Chandra Project Scientist. The nominal mission is to last until 2004.

Provenance

The collection originated from the office of John R. Casani, JPL Chief Engineer, Office of Engineering and Mission Assurance, Section 500. The collection was transferred from Casani to the JPL Archives on June 12, 2000.

Collection Arrangement and Description

The documents consist primarily of background material for the AXAF Flight Readiness Independent Review Team. The collection was compiled by John R. Casani, who served on the AXAF Development and

Pre-Ship Committee and was Chair of the AXAF Flight Readiness Independent Review Team. The bulk of the collection is dated between March-November 1998. The collection is arranged chronologically.

Included in the collection is extensive correspondence, mainly in the form of printed e-mail messages, between Casani and the rest of the members of the review board. Handwritten notes are also included.

One review conducted before the pre-ship review, the External Independent Readiness Review (EIRR) is represented in the collection with background material and e-mail from its chair, Jerry Madden.

During ground tests at TRW in June 1998, the AXAF ACIS (AXAF CCD Imaging Spectrometer) Door failed to open. This was of much concern to the independent review assessment teams, but the problem was eventually solved. The final report of the ACIS Door Failure Investigation conducted by Marshall Space Flight Center was submitted in June 1999, one month before the deployment of the CXO, and was prepared by former Apollo and Skylab Astronaut Alan Bean of the MSFC Engineering Directorate. Materials regarding this inquiry are represented in the collection, including the final report.

Conservation/Preservation

Standard preparations of documents for long term storage were completed.

Separation Statement

The original accession (2000-14) was split up into three separate collections: AXAF Flight Readiness Independent Review Team Collection (this collection), the John Casani Collection (JPL 163) and the JPL Executive Council Collection (JPL 165).

Finding Aids

No other finding aids exist for the collection.

FILE FOLDER LIST

Box 1 of 3

Fld. 1	AXAF Spectrometer, February 1993.
Fld. 2	AXAF Level 1 Policy and Requirements Document, Streamlined Version, December 21, 1993.
Fld. 3	AXAF Technical Oversight Panels, Fred J. Wojtalik, January 26, 1994.
Fld. 4	AXAF Level 1 Policy and Requirements Document, April 20, 1994.
Fld. 5	AXAF External Independent Readiness Review, Inertial Upper Stage Findings, E. R. Scheyhing, Aerospace Corporation, March 28, 1996.
Fld. 6	TRW, AXAF Imaging Verification Plan, Table of Contents, August 31, 1996.
Fld. 7	Aerospace Corporation, Focused Independent Review for the NASA AXAF IUS Mission, c. 1996.
Fld. 8	AXAF Articles, 1998.
Fld. 9	AXAF External Independent Readiness Review, held at TRW, January 12-15, 1998.
Fld. 10	Ralph Iwens, AXAF Mission Overview, February 17, 1998.
Fld. 11	AXAF Schedules, March 1998-March 1999.
Fld. 12	AXAF Correspondence, March 1998-June 1999. [folder 1 of 2]
Fld. 13	[folder 2 of 2]
Fld. 14	AXAF Acronym Listing, May 18, 1998.
Fld. 15	Guidelines for “Go-No Go” Decision on AXAF Ship and Launch, June-December 1998.
Fld. 16	AXAF, NASA-JSC Payload Safety Review Panel, Summary of Issues, after June 1998.

Fld. 17 AXAF Plan, Marshall Space Flight Center, July 1, 1998.
Fld. 18 AXAF, Splinter Sessions for Independent Flight Readiness Assessment Team, August-November 1998.
Fld. 19 Ralph Iwens, TRW, AXAF Mission Overview, August 4, 1998.
Fld. 20 Final Report of the AXAF Independent Assessment from the August 4-6 1998 Pre-Ship Review, August 24, 1998.
Fld. 21 AXAF/IUS Review Action Item Closures, September 1998-April 1999.
Fld. 22 AXAF Program Briefing, October 26, 1998.
Fld. 23 AXAF Directory, November 1998.
Fld. 24 AXAF Flight Readiness Independent Assessment Team, November 1998.
Fld. 25 AXAF Independent Readiness Review, Obligation Risk Funding Requests, November 1998.
Fld. 26 AXAF, John Casani Notes, November 1998-June 1999.
Fld. 27 AXAF Program Overview Briefing to Independent Assessment Team, November 11, 1998.

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Fld. 28 TRW, AXAF Flight Readiness Independent Assessment, November 11-12, 1998.
Fld. 29 AXAF Independent Review, IUS Program, Boeing, November 11-12, 1998.
Fld. 30 AXAF Science Requirements, Briefing to Independent Assessment Team, November 11, 1998.
Fld. 31 AXAF Level I, II Requirements Verification, November 11, 1998.
Fld. 32 AXAF Preship/Acceptance Review Team, Report to AXAF Flight Readiness Independent Review, November 12, 1998.
Fld. 33 AXAF, ACIS Door Anomaly, Review Team Report, Flight Readiness Independent Assessment Review, November 12, 1998.
Fld. 34 AXAF Independent Flight Readiness Assessment, Action Itema from November 11-12, 1998 Review.
Fld. 35 AXAF, Mechanisms Review Team Findings, TRW, J. B. Sathoff, November 12, 1998.
Fld. 36 AXAF, Space Shuttle Program Integration, November 25, 1998.
Fld. 37 AXAF, ASC Overview, Roger Brissenden, ASC Manager, December 2, 1998.
Fld. 38 AXAF, Minutes, AXAF Pre-Shipment Review, Part 3, Decision Making, December 4, 1998.
Fld. 39 Grating Verification Summary, December 6, 1998.
Fld. 40 AXAF Independent Flight Readiness Assessment, TRW, December 8-10, 1998.
Fld. 41 AXAF, ACIS Instrument, Independent Assessment Review, MIT, December 8, 1998.
Fld. 42 AXAF Independent Flight Readiness Assessment, Part 2, December 8, 1998.
Fld. 43 Transfer of AXAF X-ray Alignment to Pre-Launch, S. Texter, December 8, 1998.
Fld. 44 AXAF Roles and Responsibilities, Fred S. Wojtalik, December 8, 1998.
Fld. 45 AXAF Briefing to Independent Assessment Team, Martin Weisskopf, December 8-9, 1998.
Fld. 46 AXAF Independent Assessment Team Review, High Resolution Camera Status, December 8-10, 1998.

Fld. 47 ACIS Science Issues, December 8-10, 1998.
Fld. 48 NASA Safety and Mission Assurance, STS-93, AXAF/IUS Ground Safety Status, John Dollburg, December 9, 1998.
Fld. 49 AXAF/IUS/STS, Focused Independent Readiness Review, Mission Readiness Report, Alan R. Shibata, December 9, 1998.
Fld. 50 AXAF, RWA Life Testing, Frank Tung, December 10, 1998.
Fld. 51 AXAF Flight Readiness, Independent Assessment Team Report, December 17, 1998.
Fld. 52 AXAF Independent Flight Readiness Assessment, Presented to Dan Mulville and Ed Weiler, December 17, 1998.
Fld. 53 AXAF ACIS Door Activities, February-March 1999.
Fld. 54 Opening the ACIS Door on Orbit Overview, Preliminary, June 4, 1999.
Fld. 55 Alan Bean, Chandra X-ray Observatory, ACIS Door Failure Investigation, Final Report, June 7, 1999.

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Fld. 56 Attachments to Chandra X-ray ACIS Door Failure Investigation Report, June 7, 1999.
Fld. 57 AXAF, Chandra Flight and Ground Systems Software Verification Review, June 7, 1999.
Fld. 58 AXAF, Independent Assessment Team Issue Summary, June 9, 1999.
Fld. 59 Update Review for NASA Independent Assessment Team, June 11, 1979.
Fld. 60 Saverio D'Agostino, Ongoing JPL Response with Regard to Printed Wiring Board Quality in Light of AXAF Experiences, June 25, 1999.
Fld. 61 STS-93 Chandra/IUS-27 Flight Readiness Review, Presentation, June 30, 1999.
Fld. 62 External Independent Readiness Review Assessment of CXO Launch Readiness, June 30, 1999.
Fld. 63 AXAF Independent Flight Readiness Assessment Follow-Up, June 30, 1999.
Fld. 64 Chandra X-ray Observatory Mission Briefing, June 30, 1999.
Fld. 65 Spacecraft Flight and Ground Systems Verification Review of Chandra X-Ray Observatory, Michael A. Greenfield, n.d.
Fld. 66 AXAF Verification Overview, J. Lowrie, n.d.
Fld. 67 AXAF Miscellaneous Items, n.d.

CATALOG DESCRIPTION

Chandra X-ray Observatory Flight Readiness Review Collection, 1993-1999.
0.9 cu. ft. (3 boxes; 67 folders)

The Chandra X-ray Observatory, originally named the Advanced X-ray Astrophysics Facility (AXAF), was deployed from the Space Shuttle aboard the STS-93 mission in July 1999. Chandra is the most sophisticated X-ray observatory so far built. It is designed to observe X-rays from high-energy regions of the universe, such as hot gas in the remnants of exploded stars. In December 1998, AXAF was renamed the Chandra X-ray Observatory (CXO) in honor of the Indian-American Nobel Laureate physicist Subrahmanyan Chandrasekhar (1910-1995).

The collection includes materials from the AXAF Deployment and Pre-Ship Review, and the AXAF Flight Readiness Independent Review. While Chandra was not a JPL project, both reviews included JPL Chief Engineer John R. Casani as a member. Casani was the Chair of the AXAF Flight Readiness Independent Review.

Finding aid available in the repository.

Tracings

Jet Propulsion Laboratory – History
Casani, John R.
Advanced X-ray Astrophysics Facility
Marshall Space Flight Center - History
TRW Inc. - History
Mulville, Dan
Weiler, Ed
MacPherson, Duncan
Madden, Jeremiah J.
Huddleston, William T.
Squibb, Gael F.
Hill, Paul S.
Wojtalik, Fred J.
Bean, Alan
Weisskopf, Martin

Part of Accession 2000-14.